

Marschak: Remarks on Economics of Information

((You can be "very uncertain" about state of nature: - $\sum p_x \log p_x$ can be high--and still know "all you need to know" for decision.

One information instrument may reduce your uncertainty greatly without telling you anything useful, valuable, for decision; and you may end up with little uncertainty about state of nature, yet without knowing what you want to know.))

M. defines value of information as the average amount earned with the help of that information; this assumes that the subject "knows" (with high confidence; a risk situation) the probability distribution of the states of nature, and also the probability that a given state will result in a given message (the risk of "noise"). p. 80

The "amount of information" does not depend on the subject's (receiver's) needs or uses, his payoff function; BUT IT DOES DEPEND ON HIS P, HIS SUBJECTIVE PROBABILITIES OVER THE STATES OF NATURE. Marschak implicitly assumes this can be regarded as the same for all receivers, "objectively" given; actually, this too will generally be relative to a given receiver and a given occasion, especially where "semantic information" is involved (i.e., where the relevant information goes beyond "What message was actually sent?"; in the latter case, it doesn't affect the information content whether the message is in Sanskrit or English).

((A valuable information instrument reports all the "differences that make a difference," the information that is critical to decision; additional information, distinctions, observations do not add to its value (while an instrument that reports indefinitely more differences, contributes indefinitely more to "reducing uncertainty," may still fail to report the one difference that really matters)).

Marschak says nothing about possibility that reporting additional information, in "unnecessary" detail or with "irrelevant" distinctions and findings, may lessen the value of the instrument: in terms of processing time, processing costs, delay in decision, etc.--as well as increase the cost of the "relevant" information.

Payoff to a decision depends on the state of the world and will vary with the three function, w, α, γ (the payoff function, decision rule, and information structure); assume decision-maker can choose decision-rule and information structure (Marschak, 87). Instead of talking about expected payoff, which requires knowledge of P (probabilities over Nature) assume P unknown (OR IN DISPUTE AMONG COMMITTEE MEMBERS); then can't pick a decision rule by finding one that gives highest expected payoff (for given information structure). We could, for example, pick one that gave highest worst payoff (maximin), etc. Or Ellsberg rule. The amount we were willing to pay for a given information structure x would then depend on this rule (as well as on our payoff function). *Can't compute $V(\gamma; w, P)$; must have indep. no. $I(\hat{\alpha}, \gamma; w)$.*

Can't talk "objectively" about which info structure or decision rule "is more profitable"; must talk about which is "preferred."